

CLAIMS

1. Method for the preparation of a meat substitute product  
5 which comprises protein, wherein:
- 1) a protein material, a hydrocolloid which precipitates with metal cations and water are added to one another,
  - 2) the composition from step 1) is formed into a homogenous mixture,
  - 10 3) the mixture from 2) is mixed with a solution of a metal cation with a valency of at least 2, in order to form a fibrous product,
  - 4) the fibrous product is isolated, characterized in that
  - 15 5) the protein material comprises a milk protein material, and
  - 6) the mixture of milk protein material, hydrocolloid which precipitates with metal cations and water is formed in the presence of an amount of a phosphate material.
- 20 2. Method according to claim 1, characterized in that first of all a mixture of the protein material and water is made, the phosphate material is added to this mixture and then the hydrocolloid which precipitates with metal cations is introduced.
- 25 3. Method according to claim 1 or 2, characterized in that the milk protein material is selected from
- curd from cheesemaking
  - cheese
  - 30 - powdered milk
  - whey protein
  - alkali metal, alkaline-earth metal and ammonium caseinate.
4. Method according to one or more of claims 1 - 3,  
35 characterized in that the phosphate material is selected from alkali metal and ammonium salts of phosphoric acid or polyphosphoric acid.
5. Method according to claim 4, characterized in that the

phosphate material is selected from disodium hydrogen phosphate, sodium hexametaphosphate and trisodium phosphate.

6. Method according to claim 4, characterized in that the  
5 phosphate material is sodium polyphosphate  $(\text{NaPO}_3)_n$ , where  
n - 25.

7. Method according to one or more of claims 1 - 6,  
characterized in that the amount of phosphate material is at  
10 least sufficient to form a complex with free calcium ions which  
are present.

8. Method according to claim 7, characterized in that the  
amount of phosphate material is 0.1 - 1.5% by weight, based on  
15 the total of all the constituents of the homogenous mixture.

9. Method according to one or more of the preceding claims,  
characterized in that the hydrocolloid which precipitates with  
metal cations is present in an amount of 0.1 - 10% by weight,  
20 based on the total of all the constituents of the homogenous  
mixture.

10. Method according to claim 9, characterized in that the  
hydrocolloid which precipitates with metal cations is sodium  
25 alginate.

11. Method according to one or more of the preceding claims,  
characterized in that the pH of the homogenous mixture of  
protein, hydrocolloid which precipitates with metal cations,  
30 phosphate material and water is set to a value in the range from  
4 - 7.

12. Method according to claim 11, characterized in that to  
prepare a product with a meat-type structure starting from milk  
35 protein material, the pH is set to a value between 5.0 and 7.0.

13. Method according to claim 11, characterized in that to  
prepare a product with a fish-type structure starting from milk  
protein material, the pH is set to a value between 4.5 and 6.0.

14. Method according to one or more of the preceding claims, characterized in that a finishing material selected from flavouring, colouring and vegetable or animal fat, vegetable or animal protein and/or mixtures of two or more such materials is added to the homogenous mixture which has been formed.

15. Method according to one or more of claims 1 - 14, characterized in that  
to form a fibrous product starting from cheese curd:  
• identical quantities by weight of cheese curd and water at approximately 50°C are mixed (total weight 2A) in the presence of 0.8 - 1.2% by weight, based on 2A, of sodium polyphosphate,  
• 2.5 - 3.5% by weight, based on 2A, of sodium alginate, as well as water at approximately 50°C in an amount by weight A, are added with stirring,  
• the homogenous mixture formed is mixed with stirring with a 3 - 5% by weight strength  $\text{CaCl}_2$  solution in an amount by weight A to form a fibrous product,  
• the fibrous product formed is isolated and finished.

16. Method according to one or more of claims 1 - 14, characterized in that  
to form a fibrous product starting from cheese:  
• identical quantities by weight of grated cheese and water at approximately 50°C are mixed (total weight of 2B) in the presence of 0.8 - 1.2% by weight, based on 2B, of sodium polyphosphate,  
• 2.5 - 3.5% by weight, based on 2B, of sodium alginate, as well as water at approximately 50°C in an amount by weight B, are added with stirring,  
• the homogenous mixture formed is mixed with stirring with a 3 - 5% by weight strength  $\text{CaCl}_2$  solution in an amount by weight B to form a fibrous product,  
• the fibrous product formed is isolated and finished.

17. Method according to one or more of claims 1 - 14, characterized in that  
to form a fibrous product starting from sodium caseinate:

- a 10 - 15% strength by weight solution of sodium caseinate in water at approximately 50°C is made (total weight C) in the presence of 0.2 - 0.4% by weight of sodium polyphosphate, based on C,
  - 5 • butter is added in an amount of 15 - 20% by weight, based on C,
  - 3 - 5% by weight, based on C, of sodium alginate, as well as water at approximately 50°C in an amount by weight of 80 - 95% by weight, based on C are added with stirring,
  - 10 • the homogenous mixture formed is mixed with stirring with 3 - 5% strength by weight calcium chloride solution in an amount of 80 - 95% by weight, based on C, to form a fibrous product, and
  - the fibrous product formed is isolated and finished.
- 15 18. Method according to one or more of the preceding claims 1 - 14, characterized in that
- to form a fibrous product starting from whey protein,
- a 15 - 20% strength by weight solution of whey protein in water at approximately 50°C is made (total weight D) in the
  - 20 presence of 0.2 - 0.4% by weight of sodium polyphosphate, based on D,
  - butter is added in an amount of 12 - 18% by weight, based on D,
  - 3 - 7% by weight, based on D, of sodium alginate, as well as
  - 25 water at approximately 50°C in an amount of 80 - 85% by weight, based on D, are added with stirring, and
  - the homogenous mixture formed is mixed with stirring with 3 - 5% strength by weight calcium chloride solution in an amount of 80 - 85% by weight, based on D to form a fibrous product,
  - 30 • the fibrous product formed is isolated and finished.
19. Method according to one or more of the claims 1 - 14, characterized in that
- to form a fibrous product starting from powdered milk:
- 35 • a 25 - 35% strength by weight solution of skimmed milk powder in water (total weight E) is made in the presence of 0.5 - 1.0% by weight, based on E, of sodium polyphosphate,
  - butter is added in an amount of 11 - 15% by weight, based on E,

- 4 - 6% by weight, based on E, of sodium alginate, as well as water at approximately 50% C in an amount by weight of 65 - 75%, based on E, are added with stirring,
- the homogenous mixture formed is mixed with stirring with a 3 - 5% strength by weight  $\text{CaCl}_2$  solution in an amount by weight of 65 - 75%, based on E, to form a fibrous product,
- the fibrous product formed is isolated and finished.

20. Method according to one or more of claims 1 - 14, characterized in that the protein material is milk protein material selected from powdered milk, whey protein and caseinate, and the method is carried out in the absence of a phosphate material.

21. Method according to one or more of claims 1 - 20, characterized in that the fibrous product, after it has been formed and isolated, is pasteurized in order to be finished.

22. Method according to one or more of claims 1 - 21, characterized in that the fibrous product is packaged.

23. Meat substitute product obtained using the method according to one or more of claims 1 - 21.

24. Savoury or sweet snack obtained by processing a fibrous product formed with the aid of the method according to one or more of claims 1 - 21.

25. Ready to consume meat substitute product obtained by culinary processing of a product according to claim 23.